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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/047,462	01/14/2002	Michael V. Calcagno	M61.12-0406	1007

27366 7590 06/26/2006

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EXAMINER	
SHORTLEDGE, THOMAS E	

ART UNIT	PAPER NUMBER
2626	

DATE MAILED: 06/26/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/047,462	CALCAGNO ET AL.	
	Examiner	Art Unit	
	Thomas E. Shortledge	2626	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-44* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *21-28 and 39-44* is/are allowed.

6)☒ Claim(s) *1-5,20 and 29-32* is/are rejected.

7)☒ Claim(s) *6-19 and 33-38* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *14 January 2002* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1-4 and 29-31 are rejected under 35 U.S.C. 102(b) as being anticipated by Dahlgren et al. (5,794,050).

As to claim 1, Dahlgren et al. teach:

receiving a linguistic discourse representation structure (DRS) as the linguistic representation of the textual input (an input sentence-specific discourse structure, col. 9, lines 45-49);

receiving an entity-and-relation model of a non-linguistic domain (an event and entity mapping of the sentence discourse structure, col. 9, lines 53-65); and

generating a semantic discourse representation structure (SemDRS) in terms of the entity-and-relation model and based on evidence derived from the linguistic DRS (outputting a translated semantic discourse representation structure from a formal

semantic module, the semantic DRS is in terms of the event-and entity modeling of the input sentence-specific discourse structure, col. 9, lines 49-50, and col. 10, lines 1-10).

As to claim 2, Dahlgren et al. teach:

receiving a set of semantic mapping rules, each rule having a first side that matches DRS segments of a specified form and a second side that specifies at least a partial SemDRS (a naive semantic lexicon for mapping the input to a specific semantic form, a first side to match parsed segments of the sentence DRS and a second side that specifies a semantic discourse, col. 9, lines 5-17);

applying the set of semantic mapping rules to the linguistic DRS (applying the semantic lexicon to the sentence-specific discourse structure, col. 9, lines 5-17).

As to claim 3, Dahlgren et al. teach identifying applicable semantic mapping rules as rules having first sides that match any segments of the linguistic DRS (mapping entities in the semantic lexicon having first sides that match the parsed segments of the input DRS, mapping "battery" and "line" to "a battery of soldiers" and "a line of soldiers," col. 9, lines 5-17); and

generating patterns associated with the linguistic DRS, the patterns including a plurality of partial SemDRSs corresponding to the second sides of the applicable semantic mapping rules (generating patterns that match the first side of the mapped semantic fragments, mapping "battery" and "line" to "a battery of soldiers" and "a line of

soldiers," and not mapping "line" as a subject of "charge" because the appropriate meaning of "charge" does not accept a kind of wire as a subject, col. 9, lines 10-17).

As to claim 4, Dahlgren et al. teach combining some of the patterns, consistently with the entity-and-relation model, into a single combined solution pattern (combining the patterns in the event and entity model, col. 9, lines 60-67).

As to claim 29, Dahlgren et al. teach:

a controller configured to receive a linguistic discourse representation structure (DRS) as a linguistic representation of a textual input *(an input sentence-specific discourse structure, col. 9, lines 45-49)*, an entity-and-relation model of a non-linguistic domain *(an event and entity mapping of the sentence discourse structure, col. 9, lines 53-65),* and a set of semantic mapping rules (a naive semantic lexicon for mapping col. 9, lines 5-17);

an interpretation fragment generator, coupled to the controller, configured to apply the semantic mapping rules to the linguistic DRS to generate semantic interpretation fragments (a naive semantic lexicon for mapping the input to a specific semantic form, a first side to match parsed segments of the sentence DRS and a second side that specifies a semantic discourse, col. 9, lines 5-17);

an interpretation assembly component, coupled to the controller, receiving the semantic interpretation fragments and generating at lest one solution pattern from the semantic interpretation fragments the controller generating a semantic discourse

representation structure (SemDRS) from the solution patterns consistent with the entity-and-relation model *(outputting a translated semantic discourse representation structure from the formal semantics module, using the generated patterns that match the first side of the mapped semantic fragments, based on the event and entities, mapping "battery" and "line" to "a battery of soldiers" and "a line of soldiers," and not mapping "line" as a subject of "charge" because the appropriate meaning of "charge" does not accept a kind of wire as a subject, col. 9, lines 10-17).*

As to claim 30, Dahlgren et al. teach receiving a set of semantic mapping rules, each rule having a first side that matches DRS segments of a specified form and a second side that specifies at least a partial SemDRS (a naive semantic lexicon for mapping the input to a specific semantic form, a first side to match parsed segments of the sentence DRS and a second side that specifies a semantic discourse, col. 9, lines 5-17).

As to claim 31, Dahlgren et al. teach combining some of the patterns, consistently with the entity-and-relation model, into a single combined solution pattern (combining the patterns in the event and entity model, col. 9, lines 60-67).

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. Claims 5, and 32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Dahlgren et al. as applied to claims 4 and 32 above, and further in view of Kamp et al. (From Discourse to Logic).

As to claim 5, Dahlgren et al. do not teach arranging the solution pattern in a box structure based on the box structure of the linguistic DRS.

However, Kamp et al. teach arranging a pattern in a box structure based on the box structure of the linguistic DRS (page 119 page 120).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to combine the teachings of Dahlgren et al. with the box structure of Kamp et al. to have a compact notation for the discourse representation structure, as taught by Kamp et al. (page 120).

As to claim 32, Dahlgren et al. do not teach the linguistic DRS has elements arranged in a box structure and wherein the controller is configured to generate the

SemDRS by arranging the solution pattern in a box structure based on the box structure of the linguistic DRS.

However, Kamp et al. teach arranging a pattern in a box structure based on the box structure of the linguistic DRS to create an output semantic DRS (page 119 page 120).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to combine the teachings of Dahlgren et al. with the box structure of Kamp et al. to have a compact notation for the discourse representation structure, as taught by Kamp et al. (page 120).

5. Claim 20 is rejected under 35 U.S.C. 103(a) as being unpatentable over Dahlgren et al. as applied to claim 1 above, and further in view of Weischedel et al. (BBN: Description of the Plum System as Used for MUC-5).

As to claim 20, Dahlgren et al. do not teach generating a plurality of SemDRS ranked in order of cost.

However, Weischedel et al. teach ranking the semantic meanings by a confidence score (page 97, paragraphs 3-4).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to combine the teachings of Dahlgren et al. with the methods of Kamp et al. to generate the best semantic form produced by the interpreter, as taught by Kamp et al. (page 97, paragraph 2).

Allowable Subject Matter

6. Claims 6-19 and 33-38 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

7. Claims 21-28 and 39-44 are allowed.

The following is a statement of reasons for the indication of allowable subject matter:

As to claim 29, Dahlgren et al. teach:

a controller configured to receive a linguistic discourse representation structure (DRS) as a linguistic representation of a textual input *(an input sentence-specific discourse structure, col. 9, lines 45-49)*, an entity-and-relation model of a non-linguistic domain *(an event and entity mapping of the sentence discourse structure, col. 9, lines 53-65),* and a set of semantic mapping rules (a naive semantic lexicon for mapping col. 9, lines 5-17);

an interpretation fragment generator, coupled to the controller, configured to apply the semantic mapping rules to the linguistic DRS to generate semantic interpretation fragments (a naive semantic lexicon for mapping the input to a specific

semantic form, a first side to match parsed segments of the sentence DRS and a second side that specifies a semantic discourse, col. 9, lines 5-17);

an interpretation assembly component, coupled to the controller, receiving the semantic interpretation fragments and generating at lest one solution pattern from the semantic interpretation fragments the controller generating a semantic discourse representation structure (SemDRS) from the solution patterns consistent with the entity-and-relation model *(outputting a translated semantic discourse representation structure from the formal semantics module, using the generated patterns that match the first side of the mapped semantic fragments, based on the event and entities, mapping "battery" and "line" to "a battery of soldiers" and "a line of soldiers," and not mapping "line" as a subject of "charge" because the appropriate meaning of "charge" does not accept a kind of wire as a subject, col. 9, lines 10-17).*

As to claim 30, Dahlgren et al. teach receiving a set of semantic mapping rules, each rule having a first side that matches DRS segments of a specified form and a second side that specifies at least a partial SemDRS (a naive semantic lexicon for mapping the input to a specific semantic form, a first side to match parsed segments of the sentence DRS and a second side that specifies a semantic discourse, col. 9, lines 5-17).

As to claim 31, Dahlgren et al. teach combining some of the patterns, consistently with the entity-and-relation model, into a single combined solution pattern (combining the patterns in the event and entity model, col. 9, lines 60-67).

As to claim 32, Dahlgren et al. do not teach the linguistic DRS has elements arranged in a box structure and wherein the controller is configured to generate the SemDRS by arranging the solution pattern in a box structure based on the box structure of the linguistic DRS.

However, Kamp et al. teach arranging a pattern in a box structure based on the box structure of the linguistic DRS to create an output semantic DRS (page 119 page 120).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to combine the teachings of Dahlgren et al. with the box structure of Kamp et al. to have a compact notation for the discourse representation structure, as taught by Kamp et al. (page 120).

Claim 21 recites a method of generating a semantic interpretation of a textual input represented by a linguistic discourse representation structure (DRS), comprising the steps of applying semantic mapping rules to the linguistic DRS, mapping portions of the linguistic DRS to semantic interpretation fragments. Further, claim 21 recites applying string-based rewrite rules to tokens in the textual input, mapping tokens in the

textual input to semantic interpretation fragments, and generating a plurality of ranked semantic discourse representation structures (SemDRSs) based on the semantic interpretation fragments, ranking SemDRSs generated from interpretations spawned by applying the semantic mapping rules higher than SemDRSs based on semantic interpretation fragments spawned by applying the string-based rewrite rules. The closest prior art of record (Dahlgren et al.) teaches translating an input sentence discourse representation into a semantic discourse representation using semantic lexicon mapping, even and entity rules and pattern creation. However, Dahlgren et al. do not teach nor fairly suggest applying string-based rewrite rules to tokens in the textual input, mapping tokens in the textual input to semantic interpretation fragments, nor ranking SemDRSs generated from interpretations spawned by applying the semantic mapping rules higher than SemDRSs based on semantic interpretation fragments spawned by applying the string-based rewrite rules.

Claim 39 recites a control component in a semantic analysis system configured to maintain a plurality of data structures for semantically interpreting a linguistic discourse representation structure (DRS) that is a linguistic representation of a textual input having tokens, the data structures comprising the components of a pattern list including a list of semantic patterns generated by applying semantic mapping rules to structural elements of the linguistic DRS, a pattern-to-DRS element mapping that maps patterns in the pattern list to DRS elements that spawned the patterns, a DRS element-to-token mapping that maps between the structural elements of the linguistic DRS and

the tokens in the textual input that spawned the structural elements, and a pattern-to-token mapping between the patterns in the pattern list and tokens corresponding to the DRS elements used in generating the patterns. The closest prior art of record (Dahlgren et al.) teaches translating an input sentence discourse representation into a semantic discourse representation using semantic lexicon mapping, event and entity rules and pattern creation. However, Dahlgren et al. do not teach nor fairly suggest a pattern-to-DRS element mapping that maps patterns in the pattern list to DRS elements that spawned the patterns, a DRS element-to-token mapping that maps between the structural elements of the linguistic DRS and the tokens in the textual input that spawned the structural elements, and a pattern-to-token mapping between the patterns in the pattern list and tokens corresponding to the DRS elements used in generating the patterns.

Claims 22-28 and claims 40-44 are allowable since they are dependent on the above claims are allowable.

As to claim 6, Dahlgren et al. do not teach nor fairly suggest wherein arranging the solution pattern in a box structure comprises restoring the box structure of the linguistic UDRS onto the solution pattern to obtain the SemDRS.

As to claim 7, Dahlgren et al. do not teach nor fairly suggest prior to combining some of the patterns, generating at least one initial search state including a set of the

patterns, wherein the set of patterns is formed such that the patterns in the set account for every element in the linguistic DRS box structure and such that none of the elements in the linguistic DRS box structure is accounted for by more than one pattern in the set of patterns.

As to claim 33, Dahlgren et al. do not teach nor fairly suggest the controller comprises a search state generator configured to generate at least one initial search state including a set of interpretation fragments, wherein the set of interpretation fragments is formed such that the interpretation fragments in the set account for every element in the linguistic DRS box structure and such that none of the elements in the linguistic DRS box structure is accounted for by more than one interpretation fragment.

Claims 8-12, 13-19 and 34-38 are would also be allowable since they depend from claims 7 or 33.

Conclusion

8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. See PTO-892.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Thomas E. Shortledge whose telephone number is (571)272-7612. The examiner can normally be reached on M-F 8:00 - 4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Richemond Dorvil can be reached on (571)272-7602. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

TS
06/20/06

RICHEMOND DORVIL
SUPERVISORY PATENT EXAMINER